

# Branch Museum of Architecture and Design

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'Innovations Since the Nineteenth Century'  
Tion T. Carter

# 1 The Change in Design Over Time



Figure 1: The Classic Two-Seater.

As many may have known even before visiting the exhibit, bicycles and sport of cycling have been around for quite some time now, dating back to as early as the beginning of the nineteenth century. Rather than walking and horseback rides, this became another useful means of transportation for people during this time. When bicycles were first innovated, they were composed of purely aluminum which at the time seemed like a strong material to use. While aluminum was a strong material, when impacted strongly it would break in a brittle manner causing catastrophic failures. Along with the aluminum frames, wooden wheels which at the time, due to cost, manufacturing, and its lightweight, was used until they were banned in the early twentieth century due to similar tragedies as that of the aluminum frame.

Possibly due to the malfunctions of the wooden wheels on the bikes, new innovations became popular in the 1930's. With the declination of the wooden wheels came the uprising of the "balloon tire bikes". These became popular as they were not only more stable than the ones previously created, but they also imitated motorcycles. Many cyclists were now using bicycles for more than just for transportation, but also recreational use. Bikes were used in WWII for duties on sight as well as a means for safe transportation after landing from parachutes. These balloon bike tires allowed cyclists to create their own trails with paths to follow, which lead to today's interest in mountain bike riding. The significance of gears and shifters became an important factor that designers began to improve during this era as they changed from manual levers to cable wires to help shift between gears allowing riders to have more control on the resistance the bike applied.



Figure 2: Steam Bent Wooden Wheel



Figure 3: Balloon Bike Wheel.

## 2 Experimentation and Innovations

During the twentieth century, throughout the world, innovations in automotive industry along with many other means for transportation caused the demand for bicycles to decrease. Over time many began to shy away from the aluminum bikes while a few kept balloon tire bikes in spite of their parents.

To accommodate the cyclists, designers began manufacturing what was now known as a middleweight bike which consisted of material experimentation—the combination of balloon tire bikes and aluminum bikes. These designs were intended to increase the riders speed and travel distance. Compared to the previous balloon tire and aluminum bikes, these new-classed middleweight bikes could be distinguished by their lighter frame and narrow tires.

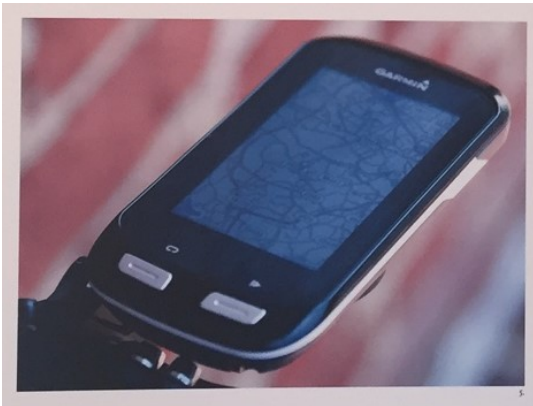


Figure 4: Automatic Gear Shifters.



Figure 5: Aerodynamically Innovated Bike.

While both balloon tire and middleweight bikes are used excessively by many people today, subsequently after the turn of the century, there have been increasing innovations due to many famous events such as the Tour de France or the Richmond Union Cycliste Internationale (UCI). These new changes in design was more concentrated on improvements to the gear shifters as well as the physical appearance of the bike. Improved technology has now allowed for the automatic gear shifter due to GPS location tracking in combination with topographic maps to help detect the changes in elevation. Figure 4 above shows the improved technology. As for the framework of bike, it has designed so that the when traveling, there would be less drag force due to air resistance. One feature of this aerodynamic design was by remaining stability within the bike while having the beams in frame more flat-like compared to the traditional circular cross-sectional bars shown in Figure 5.